UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

April 4, 2000

Reply To
Attn Of: OW-131

Jeanne Hanson
U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Marine Fisheries Services
222 W Seventh Avenue, #43
Anchorage, Alaska 99513-7577

RE: John M. Asplund Water Pollution Control Facility
Municipality of Anchorage

Dear Ms. Hanson:

The Environmental Protection Agency (EPA) is in the process of reissuing a National Pollutant Discharge Elimination System (NPDES) permit for the above referenced facility. In association with the NPDES permit, the Alaska Department of Environmental Conservation (DEC) has submitted to EPA, State adopted site-specific criteria (SSC) for metals and turbidity for the upper Cook Inlet - Point Woronzoff area. EPA has the responsibility to review and approve or disapprove any water quality standards revisions including SSC developed and adopted by Alaska.

EPA reissuance of the NPDES permit and EPA approval of SSC are considered federal actions. These actions are subject to the consultation requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) and the Interim Final Rule for implementing the essential fish habitat (EFH) provisions of MSFCMA (62 FR 66531, December 19, 1997).

EPA has determined that reissuance of the NPDES permit for the water pollution control facility and the approval of site-specific numeric criteria for metals and a narrative criterion for turbidity are not likely to have an adverse effect on EFH. EPA nevertheless has voluntarily conducted an assessment using the format specified in 50 CFR § 600.920(a)(1). This voluntary assessment also provides the rationale for EPA's determination of no likely adverse effect.

The purpose of this letter is to share our voluntary assessment with your agency and to request any comments that you may have on our analysis and determination. In order to accommodate our schedule for reissuing the final permit and completing our approval of the SSC , we would appreciate your response by April 28, 2000, if possible.

If you have any questions or comments regarding this letter or the enclosed voluntary EFH assessment feel free to contact me by telephone at (206) 553-1295 or email at brough.sally@epamail.epa.gov.

Sincerely,

Sally Brough
Water Quality Standards Coordinator

ESSENTIAL FISH HABITAT (EFH) DETERMINATION AND VOLUNTARY ASSESSMENT

1. Background and Purpose

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), PL-104-267, which regulate fishing in U.S. waters, included substantial new provisions to protect important habitat for all federally managed species of marine and anadromous fish. The amendment created a new requirement whereby Regional Fishery Management Councils are required to describe and identify "essential fish habitat" (EFH) in each fishery management plan. EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." 50 CFR § 600.10. All federal agencies are required to consult with the National Marine Fisheries Service (NMFS) on any actions authorized, funded, or undertaken by the agency that may adversely affect EFH. 50 CFR § 600.920.10. EPA, Region10, is assessing the effects on EFH of two related actions.

The first action involves the EPA issuance of a permit to regulate a point source discharge. The Clean Water Act (CWA) authorizes EPA to administer the National Pollutant Discharge Elimination System (NPDES) permit program. The NPDES program regulates discharges from point sources to waters of the United States. While the majority of states are authorized to administer the NPDES program, the State of Alaska is not among them. Thus, EPA, Region 10, regulates the point source discharges in the state by issuing NPDES permits.

The second action involves EPA approval of State-adopted water quality standards (WQS). The primary objective of the CWA is to restore and maintain the chemical, physical and biological integrity of the Nation's waters. WQS set goals for water quality, provide the regulatory basis for controlling water quality under federal law, and establish the yardstick for measuring water quality. Section 303(c) of the CWA describes the requirements and procedures for developing, reviewing, revising, and approving state WQS. Under section 303(c) of the CWA, EPA is to review and approve or disapprove State-adopted WQS.

2. Determination of "No Adverse Effect"

U.S. EPA, Region 10, proposes to undertake two federal actions contemplated for the Point Woronzof area of Upper Cook Inlet. The actions are: 1) EPA reissuance of a National Pollutant Discharge Elimination System (NPDES) permit for the Municipality of Anchorage's John M. Asplund Water Pollution Control Facility, and 2) EPA approval of State of Alaska site-specific water quality criteria revisions for the Point Woronzof area. EPA has determined that neither contemplated action would adversely affect EFH.

3. Voluntary Assessment

Although EPA has determined that it's proposed actions are not likely to have an adverse effect on EFH, EPA nevertheless has voluntarily conducted an assessment using the format specified in 50 CFR § 600.920(a)(1). This voluntary assessment also provides the rationale for EPA's determination of no adverse effect. This voluntary assessment provides the following information:

- Listing of EFH Species in the Action Area
- Description of the Facility, Discharge Location, and Site-Specific Criteria Revisions
- EPA's Evaluation of Potential Effects to EFH

4. EFH Species in the Facility Area

Cook Inlet in the Point Woronzof Area is designated as essential fish habitat for Walleye pollock, Pacific cod, Sculpins, Eulachon, and Pink, Chum, Sockeye, Chinook, and Coho salmon (Habitat Assessment Reports for Essential Fish Habitat, National Marine Fisheries Service, 1998).

5. Description of the Facility, Discharge Location, and Water Quality Standards Revisions

A. Facility Description.

The Municipality of Anchorage treatment plant serves the entire Anchorage area. Plant influent is primarily of domestic origin, although an industrial component is included. There are no combined sewers in the Anchorage sewer system. The existing facility provides primary treatment for a design average flow of 58 million gallons per day (mgd) and a maximum hourly flow of 154 mgd. The actual average daily discharge is approximately 33 mgd. The applicant projects an average daily discharge of 36 mgd for the year 2005.

Existing treatment units provide screening, grit removal, sedimentation, skimming, and chlorination. Sludge from the primary clarifiers is thickened and dewatered. The dewatered sludge and skimmings are incinerated and the ash disposed of in a sanitary landfill. Within the permit period, the sludge volume is expected to increase above the incinerator capacity. The excess sludge will be dewatered and disposed at the city's landfill.

Chlorinated primary effluent is discharged through a 120 inch diameter chlorine contact tunnel and then through an 84 inch diameter outfall to Cook Inlet. Additional description of the facility included activities and physical characteristics of the discharge can be found in the EPA Fact Sheet for the EPA proposed reissuance of the permit which was made available for public review on November 8, 1999.

B. Discharge Location (See Figure 1).

The outfall discharges to the saline estuarine waters of Knik Arm in Cook Inlet, 804 ft from

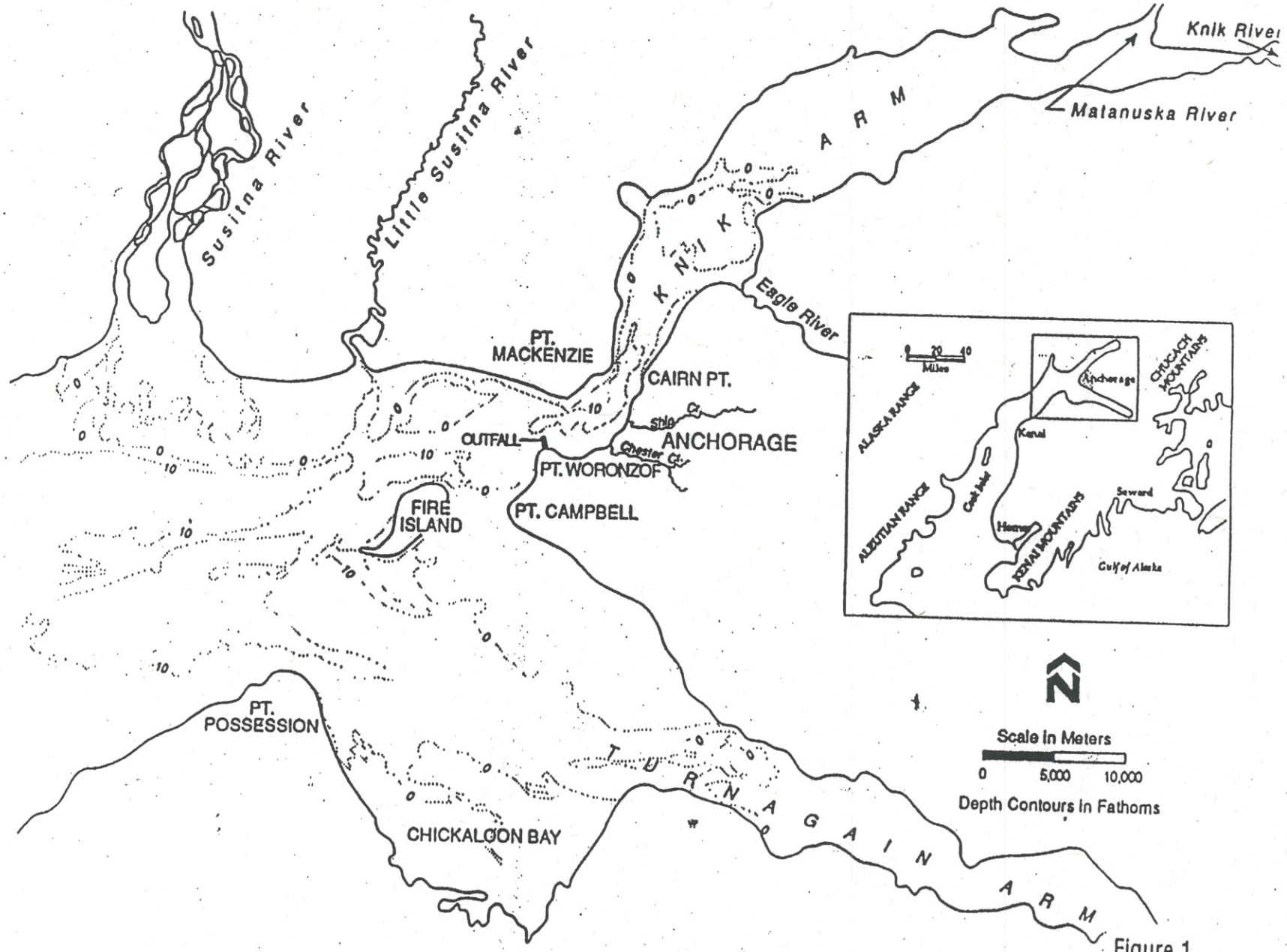

Figure 1
Location Map

shore off Point Woronzof (Figure 2). The discharge depth of the diffuser during the typical 24-hour tidal cycle range from 11.5 feet to 40.5 feet. The outfall location is 61° 12' 22.5" N, 150° 01' 8.7" W. The semidiurnal mixed tides in Knik Arm have a diurnal range of 30 ft and an extreme range of 39 ft. The tides produce swift currents and vigorous mixing off of Point Woronzof. Knik Arm exhibits high tidal velocities (up to approximately 8.2 ft/sec), extensive intertidal mudflats (60 percent of Knik Arm), a brackish salinity range (from 4 parts per thousand (ppt) in summer to 21 ppt in winter), and ice flows from November through April. Currents are influenced primarily by the tides and secondarily by freshwater inflow.

The major rivers and streams contributing fresh water to Knik Arm include the Matanuska River, Knik River, Eagle River, Ship Creek, and Chester Creek. These sources of fresh water, combined with other rivers flowing into Cook Inlet, keep the salinity of Knik Arm generally below 20 ppt. The strong tidal mixing results in weak vertical density gradients throughout the year.

Knik Arm in the vicinity of the Anchorage outfall is classified by the State of Alaska as marine water subject to water quality criteria established for water use classes 2 (A-D) (18 AAC 70.020): aquaculture, seafood processing and industrial water supply, water contact and secondary recreation, growth and propagation of fish, shellfish, other aquatic life and wildlife, and harvesting for consumption of raw mollusks or other raw aquatic life. Further description of the waters in the action area including circulation, currents, flushing, and stratification can be found in the Fact Sheet accompanying the draft permit, issued November 8, 1999.

C. Site-Specific Water Quality Criteria Revisions.

Alaska has adopted revisions to its water quality standards regulations to establish numeric site-specific criteria for a defined portion of upper Cook Inlet near Point Woronzof. The numeric site-specific criteria are acute and chronic marine aquatic life criteria for arsenic, cadmium, chromium VI, copper, lead, mercury, nickel, selenium, silver, and zinc (all measured using the dissolved method) and turbidity.

1. Site-Specific Area

The area for which the State of Alaska has adopted site-specific criteria is shown in Figure 3. The site-specific area is defined by natural physical features, boundaries and local bathymetry, as well as consideration of the physical oceanographic processes in the area. The area extends from the constriction of Knik Arm at Point Cairn to the northwest, is bounded by the shoreline to the mudflats at the entrance to Turnagain Arm and Fire Island on the on the southwest and west respectively. (Request for SSC, 1999, pp 1-1 to 1-3)

The size of the site-specific area was determined based on two factors: the distance of a tidal excursion of a water parcel and the farfield dilution predictions of hydrodynamic and water quality models of Cook Inlet. The site-specific area is less than 1/3 of a tidal excursion and is contained within the immediate tidal influence occurring in the vicinity of Pt. Woronzof.

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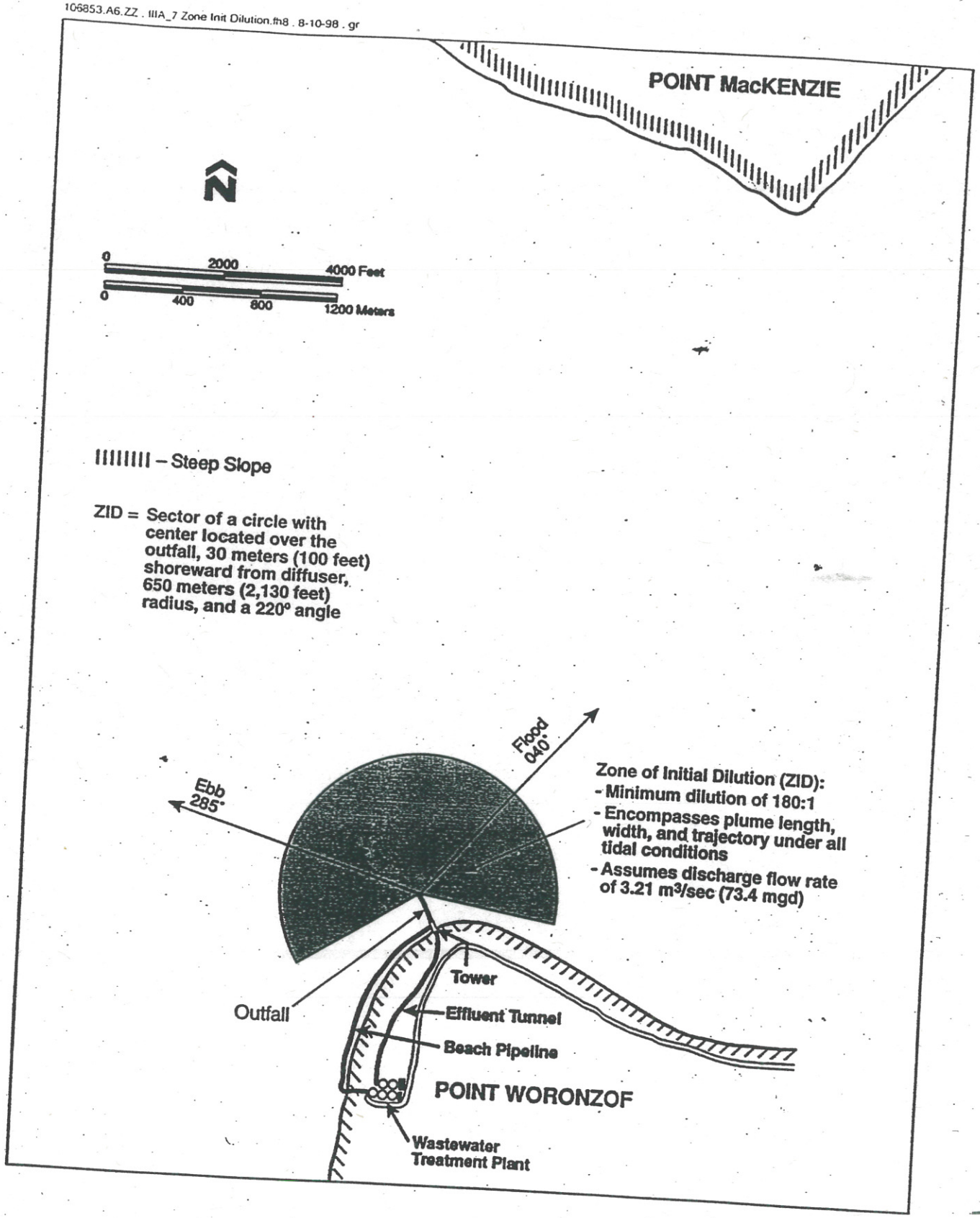

Figure 7

The Zone of Initial Dilution for the Point Woronzof Outfall

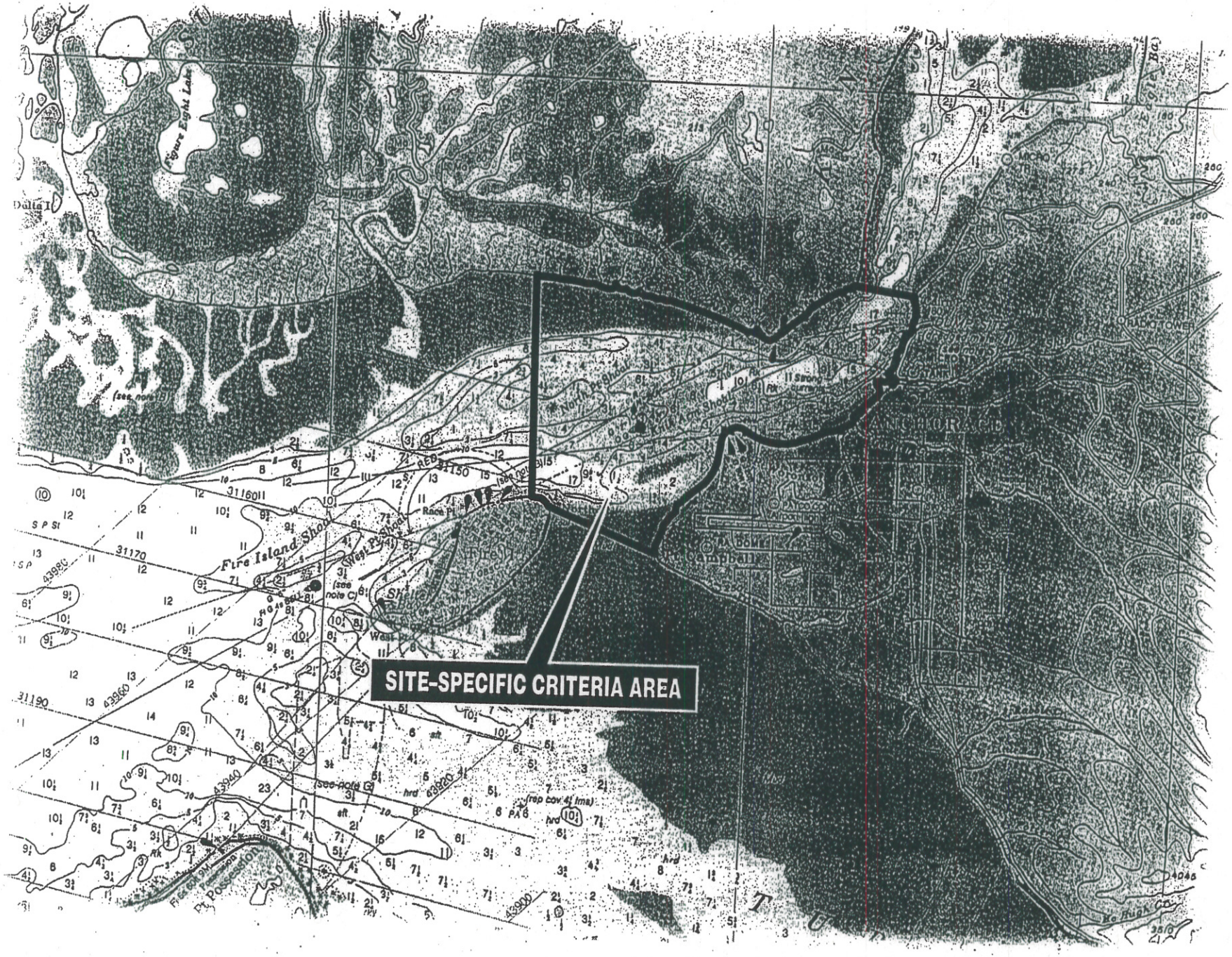

Figure 3

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(Request for SSC, 1999, pp 1-1 to 1-3)

2. Numeric Site-Specific Criteria

The numeric site-specific criteria adopted by Alaska are consistent with EPA's most recent national criteria guidance for metals. (EPA, May 4,1995, 60 FR 22228) EPA's criteria guidance is developed under Section 304(a) of the CWA and is based solely on data and scientific judgements on the relationship between pollutant concentrations and environmental and human health effects. Section 304(a) criteria do not reflect consideration of economic impacts or the technological feasibility of meeting the chemical concentrations in ambient water. The State's numeric site-specific criteria are shown in the following table.

Site-Specific Criteria for Upper Cook Inlet

POLLUTANT	**Marine Aquatic Life Acute** (ug/l)	**Marine Aquatic Life Chronic** (ug/l)
Arsenic	69	36
Cadmium	42	9.3
Chromium VI	1100	50
Copper	4.8	3.1
Lead	210	8.1
Mercury	1.8	0.025
Nickel	74	8.2
Selenium	290	71
Silver	1.9	- -
Zinc	90	81
Turbidity	not to exceed the natural condition	not to exceed the natural condition

6. EPA's Evaluation of Potential Effects to EFH

A. Physical Conditions of the Site

Knik Arm, located at the head of Cook Inlet, is part of an estuarine system with one of the largest tidal ranges in the world (30 to 39 feet). Knik Arm exhibits high tidal velocities (up to 250 cm/sec.), extensive intertidal mudflats, a brackish salinity range and extensive ice floes from

November through April. Currents and seawater density gradients are influenced primarily by tides and secondarily by freshwater inflow, winds, and other factors. The tides produce swift currents and vigorous mixing off Point Woronzof. (Request for SSC, 1999, p 1-2)

B. Aquatic Life in the Site-Specific Area

Diversity and abundance of phytoplankton and zooplankton are extremely low in Knik Arm because of the physical conditions in the arm. Practically no benthic floral or faunal organisms were found at Pt. Woronzof or a control location near Point Mackenzie. Intertidal and subtidal benthic biota are naturally limited because of the swift currents, large tidal ranges, and high suspended solids loading in upper Cook Inlet and Knik Arm that prevent colonization of the substrate or smother and abrade organisms that do become established. (Renewal Application, 1998, p. IIC-1)

The fish community in the vicinity of the discharge is dominated by transitory, anadromous species. These include threespine stickleback and several salmonid species found in the area during periods of migration. Information on residence time is preliminary in nature but indicates that residence is less than one week for chum salmon fry. Stomach contents showed that coho and sockeye young had a predominance of insect prey, presumedly consumed in freshwater, but this type of information did not provide an estimate of residence time in the Arm. The predominance of marine prey in chinook stomachs suggests a longer residence time for this species. Eulachon and threespine stickleback do not appear to have resident populations. (Renewal Application, 1998, pp. IIC-31 to IIC-43)

C. Metals Concentrations at the Site

The concentrations of metals in upper Cook Inlet and Knik Arm originate from three primary sources: waters introduced at the mouth of the inlet (oceanic contributions), inputs from runoff from the surrounding drainage (dominated by riverine inputs), and anthropogenic discharges (dominated by the Pt. Woronzof wastewater treatment plant). The oceanic contributions to the metals loadings are not significant when compared to the loading from riverine sources. (Request for SSC, 1999, p. 2-11)

The Pt. Woronzof wastewater treatment plant is the largest anthropogenic source in the area and is approximately an order of magnitude higher in flow than other such sources. The riverine loadings, characterized by samples taken upstream of major human influence, provide most of the metals loading to Knik Arm. Using a set of link-node numerical models, the typical salinity measured in Knik Arm, and the measured values of various metals the relative contribution to background from the effluent and riverine sources can be estimated (oceanic contributions provide only a minor contribution). Such calculations, based on simplified mass balance approached, provide an overall assessment of the impacts and contributions of various sources. In general, the effluent contribution is on the order of 1 to 0.01 percent of the background metals concentration. (Request for SSC, 1999, p. 2-12)

The riverine loadings can easily account for most of the total recoverable metals in the receiving

water with the possible exception of arsenic, copper, and nickel in the dissolved fraction. Even for these metals the riverine loading appears to account for a substantial fraction of the measured levels.

D. Turbidity at the Site

The receiving water levels of turbidity have never been observed as low as the 25 NTU criterion that existed for the site. The Turbidity at the site ranges from 100 NTU to 250 NTU. The high turbidity is a direct result of riverine input of fine sediment generated by glacial scouring of rocks in the river drainage basins. Because of the high levels of suspended solids delivered by the rivers, the turbidity in the site waters results primarily from the suspended solids. River samples collected upstream of most human influence demonstrate that river loads account for most of the suspended solids observed in Knik Arm (Request for SSC, 1999, p.3-1).

E. Water Quality Standards Revisions

Water quality is an important component of aquatic life habitat. NPDES permits are developed to protect water quality in accordance with state water quality standards. A state's water quality standards include use classifications and numeric and/or narrative water quality criteria. The use classification system designates the uses that each water body is expected to achieve (such as aquatic life, contact recreation, etc.). The numeric and/or narrative water quality criteria are the criteria deemed necessary, by the State, to support the beneficial use classification of each water body.

EPA and States evaluate toxicological information from a wide range of species and life stages in establishing water quality criteria for the protection of aquatic life. EPA's national recommended criteria consider toxicity and bioaccumulation studies on aquatic animal and plants and all data must be well-documented and verified. A database of organisms, from eight taxonomic groupings, is used to be representative of the diversity and range of sensitivities of aquatic life. For example, the criteria for ammonia in saltwater recently adopted by the State of Alaska are based on bioassays (predominantly acute tests) of 21 marine species in 18 genera. Data for the most sensitive life stages of a given species are used when available. Examples of additional data that might affect a criterion include: effects on single-celled animals; delayed effects; filed studies; behavioral, biochemical, histological, and physiological effects; and carcinogenicity, mutagenicity, and teratogenicity.

EPA national water quality criteria guidance reflect magnitude, duration, and frequency of the pollutant of concern.

> Magnitude - Water quality criteria for aquatic life contain two expressions of allowable magnitude: a criterion maximum concentration to protect against acute (short-term) effects and a criterion continuous concentration to protect against chronic (long term) effects. EPA derives acute criteria from 48- to 96- hour tests of lethality or immobilization. EPA derives chronic criteria from longer term tests that measure survival, growth, or reproduction.

Duration - The quality of ambient water varies in response to variations in effluent quality, tides , and other factors.. Organisms in receiving water are not experiencing constant, steady exposure but rather are experiencing fluctuating exposures. Thus, EPA's criteria guidance indicates a time period over which exposure is to be averaged, as well as an upper limit on the average concentration, which limits the duration of exposure to elevated concentrations. For acute criteria, EPA recommend an averaging period of one hour (the one hour average exposure should not exceed the acute criterion). For chronic criteria, EPA recommends an averaging period of 4 days (the 4 day average exposure should not exceed the chronic criterion).

Frequency - To predict the attainment of criteria , it is necessary to specify the allowable frequency of exceeding the criteria. EPA recommends an average frequency for excursions of both acute and chronic criteria not to exceed once in 3 years.

In conclusion, EPA development of aquatic life criteria under section 304(a) of the Clean Water Act is a comprehensive and complex process that uses a large data base of information on effects. This process results in conservative numeric aquatic life criteria that protect individual species and aquatic communities.

Alaska has adopted site-specific criteria that are consistent with EPA's most recent and scientifically up-to-date acute and chronic aquatic life criteria for metals (except for the chronic criterion for mercury) (EPA, April 1999, 822-Z-99-001). EPA recommends dissolved aquatic life criteria to set and measure compliance with metal criteria (EPA, May 5, 1995, 60 FR 22228). EPA has determined that the dissolved criteria will provide the same level of protection for aquatic life as the criteria measured as total recoverable because particulate metal is not as biologically available as dissolved metal. Due to the naturally occurring glacial till, the predominate form of metal in upper Cook Inlet is particulate metal and exceedences of total recoverable metals criteria occur.

In the case of mercury, Alaska has adopted an older EPA chronic aquatic life criterion (0.025 ug/l) (EPA, 1992, 57 FR 60848) that is more stringent than the one found in EPA's most recent publication of National Recommended Water Quality Criteria (0.94 ug/l) (EPA, April 1999, 822-Z-99-001). The State evaluated the potential for conversion of mercury to methyl mercury under the conditions found at the site; the proximity commercial and subsistence fisheries; and whether mercury has bioaccumulated in resident species or migratory species. Alaska determined that mercury has not bioaccumulated in resident (cod) or migratory fish species (salmon) based on observed fish tissue levels of mercury and that conversion of inorganic mercury to methylmercury is not likely based on the characteristics of the site. (Request for SSC, 1999, pp,5-1 to 5-14)

The turbidity in upper Cook Inlet is attributable to suspended solids in rivers that flow into upper Cook Inlet. The natural levels of turbidity at the site exceed the old Alaska turbidity criterion of 25 NTU. Since aquatic life has adjusted through time to the natural levels of turbidity found at

the site, a criterion that does not allow an increase in the natural level of turbidity will not stress the aquatic life found in the site -specific area.

F. NPDES Permit Development

NPDES permits are developed to protect water quality in accordance with State WQS. As part of the permit writing process, NPDES permit writers evaluate a wide range of chemical constituents (as well as whole effluent toxicity testing results) to identify pollutants of concern, from a discharge, with respect to the criteria values. When a facility discharges a pollutant at a level that has a potential to exceed the water quality criteria standards, permit limits are established to prevent exceedences of the criteria in the receiving water (outside any authorized mixing zone).

The development of permit limits for an NPDES discharger includes the basic elements of ecological risk analysis. The underlying technical process leading to NPDES permit requirements incorporates the following elements of risk analysis :

Effluent Characterization

Characterization of effluent constituents using information from a variety of sources, including:
Priority pollutant scans
Permit compliance monitoring
Whole effluent toxicity testing
Effluent variability
Quality assurance evaluations

Identification of Pollutants of Concern and Threshold Concentrations

Identification of pollutants of concern, including:
Pollutants with aquatic life criteria in the Alaska Water Quality Standards
Other pollutants of concern based on available information

Exposure and Wasteload Allocation

Analysis of the transport of pollutants near the discharge point with respect to the following:
Mixing zone policies in the Alaska Water Quality Standards
Dilution modeling and analysis
Exposure considerations (e.g., prevention of lethality to passing organisms)
Consideration of multiple sources and natural background concentrations
Total Maximum Daily Loads (where appropriate)

Statistical Evaluation for Permit Limit Development

Calculation of permit limits using statistical procedures addressing the following:
Effluent variability and non-continuous sampling
Fate/transport variability

Duration and frequency thresholds identified in the water quality criteria

Monitoring Programs

Development of monitoring requirements, including:
Compliance monitoring of the effluent
Ambient water column monitoring
Ambient sediment monitoring
Benthic surveys
Bioaccumulation studies

Additional information on EPA's approach to aquatic life protection is outlined in detail in the Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001, March 1991).

The risk analysis outlined above has been used to develop the limitations of the NPDES permit. The limitations in the NPDES permit were developed to prevent exceedences of the aquatic life criteria of the receiving waters. As discussed previously, water quality criteria are developed to protect aquatic life species and communities. Since the NPDES permit limitations are developed to achieve the aquatic life criteria, this NPDES permit will be protective of both the managed EFH species as well as their prey.

F. Sediment at the Site

EPA recognizes that wastewater discharges can have physical and/or chemical effects on sediment habitat. For facilities with pollutant discharges that could impact sediments, EPA can require the permittee to sample sediments in the outfall area and analyze them for pollutants of concern. Sediment sampling has been conducted by the Municipality of Anchorage as part of the previous NPDES permit. The results indicate that there was no evidence of any significant accumulation of organic material from the effluent in the sediments. Because of the rapid currents in the vicinity of Point Woronzof, effluent settleable solids are not expected to settle in the vicinity of the diffuser and the existing sediments consist of waste gravel and cobble with very low organic content. No dissolved oxygen depression resulting from sediment demand and resuspension of sediments is expected. EPA, however, has proposed that the facility repeat sediment monitoring in the fourth year of the five year permit term.

EFH Determination

EPA intends to approve the numeric site-specific water quality criteria for metals and the narrative criterion for turbidity submitted by Alaska for the Pt. Woronzof area. EPA has developed the proposed permit to protect aquatic life species in Cook Inlet in accordance with the Alaska water quality standards. EPA believes that the Alaska water quality criteria for the protection of aquatic life should protect both the managed EFH species and their prey. EPA has determined that approval of the site-specific criteria for the site and issuance of this permit based

on such criteria is not likely to adversely affect any EFH in the vicinity of the discharge. EPA has provided NMFS with copies of the draft permit and fact sheet during the public notice period. Any recommendations received from NMFS regarding EFH will be considered prior to reissuance of this permit.

References

Request for Site-Specific Criteria for Point Woronzof Area of Cook Inlet, Submitted to Alaska Department of Environmental Conservation, submitted by the Municipality of Anchorage (MOA), Anchorage Water and Wastewater Utility, January 5, 1999.

Renewal Application for NPDES Permit and 301(h) Variance from Secondary Treatment, Submitted to EPA, Region 10, Submitted by the Municipality of Anchorage (MOA), Anchorage Water and Wastewater Utility, October 1, 1998.

Environmental Protection Agency, *40 CFR Part 131, Stay of Federal Water Quality Criteria for Metals: Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants; State's Compliance-Revision of Metals Criteria: Final Rules.* 60 FR 22228, May 4, 1995.

Environmental Protection Agency, *40 CFR Part 131, Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants; States' Compliance Final Rules.* 57 FR 60848, December 22, 1992.